



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: BALDOCK, MARK R.
Application No.: 09/992,269
Filing Date: 11/14/01
For: BROADCAST DATA RECEIVER
Art Unit: UNKNOWN

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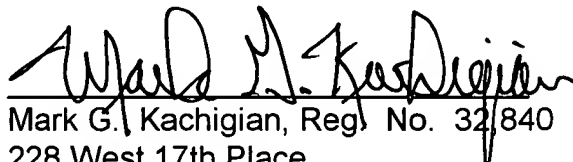
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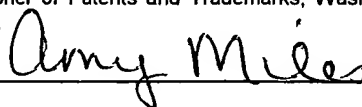
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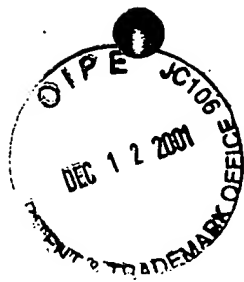
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The Patent Office

Cardiff Road
Newport
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1. Your reference

GW-G30603
E583764-3 D00346
P01/7700 0.00-0027812.7

2. Patent application number
(The Patent Office will fill in this part)

0027812.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Pace Micro Technology Plc

Victoria Road
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BD18 3LF

Patents ADP number (if you know it) 7588569001

If the applicant is a corporate body, give the country/state of its incorporation

England

4. Title of the invention

Broadcast data Receiver

5. Name of your agent (if you have one)

Bailey Walsh & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

5, York Place
Leeds
LS1 2SD

Patents ADP number (if you know it)

224001 ✓

6. If you are declaring priority from one or more earlier patent applications, give the and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

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7. If this application is divided or otherwise derived from an earlier UK application, the earlier application

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- a) any applicant named in part 3 is not an inventor, or
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Description 5

Claim(s)

Abstract

Drawing(s)

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Priority Documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents
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11. I/We request the grant of a patent on the basis of this application

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12. Name and daytime telephone number of person to contact in the United Kingdom

G Wood
0113 2433824

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Broadcast Data Receiver

This invention relates to a broadcast data receiver for use with a television system.

The television system for the purposes of the following description includes a broadcast data receiver (BDR) for receiving digital data in the form of data streams from one or more broadcasters via satellite, terrestrial or cable and generating audio, visual and/or auxiliary data therefrom. Data streams transmitted at different frequencies from the broadcaster(s) correspond to different services such as different television channels. A display screen is provided for display of the visual data and speakers are typically provided for sounding of the audio data.

An example of a service is a television channel and it will be understood by persons skilled in the art that although the following description refers to channel information, this can include two channels encoded and transported on a single channel or carrier, thus requiring only a single tuner. Alternatively, channels can be encoded on a number of different carriers, thus requiring a timer to be tuned to different RF carriers to receive different channels, tuners and/or the like.

Some BDRs are provided with multiple tuner/front ends, which allow the BDR to function using more than one data stream at any particular time. For example, the multiple tuners can allow a user to watch a particular channel which can be referred to as the primary function whilst receiving and storing data for a different channel using the BDR, which can be referred to as the secondary function.

One conventional method by which BDRs can generate a list of available channels is by "scanning" their tuner frequency bands. This procedure is typically actuated manually and, as such, if a user wishes to find out whether

there are any new channels available via the BDR, the user has to periodically rescan the tuner frequency bands of the BDR to update the list. This is time consuming and is therefore undesirable. If the user does not frequently rescan the tuner frequency bands of the BDR, the user may not be aware of new channels which are available. In addition, technical support is frequently required by users for assistance on how to manually scan for new channels.

It is therefore an aim of the present invention to provide a broadcast data receiver which overcomes the abovementioned problems.

According to a first aspect of the present invention there is provided a broadcast data receiver for a television system, said television system including a display screen and said broadcast data receiver (BDR) receiving digital data services in the form of data streams from one or more broadcasters via satellite, terrestrial or cable transmission systems, said data streams being broadcast and transmitted on RF carriers at different frequencies corresponding to a number of different services and said BDR selectively processing and generating audio, visual and/or auxiliary data from said data streams, in accordance with user control, said BDR having two or more tuners for processing data relating to two or more different services and wherein when at least one of the tuners is not in use, the at least one tuner scan carrier frequency bandwidth to identify service information.

Preferably the service information relates to television and/or radio channel identification information comprising audio, video and/or auxiliary data.

Preferably the channel information obtained by the at least one tuner can relate to new channel information and/or previously identified channel information.

In one embodiment the channel information is stored in memory means of the BDR and if new channel information is identified since a previous search, a message or symbol can be displayed visually and/or audibly to inform the user

of the apparatus of the new channel or channels and/or invite the user to view the new channel(s).

Preferably if the at least one tuner is scanning for available channel information and is then required for use on a data stream, any scanning being performed by the tuner is suspended and the tuner is made available for the data stream. The scanning can be resumed when the tuner is no longer required to be in use.

An advantage of the present invention is that tuners which would normally have no working function can be used to scan for channel information. This removes the requirement for the user to remember to manually activate the BDR to scan the tuner frequency bandwidths to search for new channel information and update previously searched channel information. This in turn results in the user becoming aware of channels that they may not have previously been informed about at all or would only have been informed about when the user next manually programmed the BDR to scan for new channels. In addition, the channel information can be used to update network information tables and delete any discontinued channels.

An embodiment of the present invention will now be described with reference to the following description.

Some broadcast data receivers are now provided with multiple tuners to allow use of more than one channel by the BDR at any particular time. This allows a user, for example, to watch one channel whilst using the BDR to record from a different channel.

In accordance with the present invention, the multiple tuners are provided with dual functionality; a primary function for locating and locking onto incoming data streams over a range of bandwidths, a secondary function, such as recording data from another service which is implemented when a tuner is not

being used for the primary function, and a further function which comprises background scanning of bandwidth for channel information.

In the following description, a tuner is referred to as being idle when it is not being used for its primary or secondary function. For example, the user may be watching a channel using a first tuner but not using the BDR to record from a different channel and thus a second tuner may be idle. Alternatively, the BDR may be performing several operations but all of which are on a single data stream from a single source (i.e., using a single tuner) and thus a second tuner is idle.

The status of the tuner is monitored by low-level drive software of the BDR and the criteria for determining when a tuner is idle is whether the software controlling the tuner has relinquished the resources of the tuner voluntarily or has not reserved the tuner for use.

The inventive function of the tuner is initiated as soon as the tuner is identified as being idle and the tuner then commences to scan the tuner frequency bandwidths for services or television or radio channel information. This channel information can be stored in memory means of the BDR, such that when an updated search for channel information is performed, the microprocessor of the BDR can determine whether any new channel information has been identified. The channel information obtained can include the bandwidth frequency of the channel and/or the like, so that the channel or service can be subsequently identified.

It is noted that a pre-determined period of time can be allowed to lapse following determination that a tuner is idle, before the inventive function of the tuner is initiated. This allows time for the primary or secondary functions of the tuner to be requested again, for example as is the case if a person is channel hopping to and from different channels. The pre-determined time period is typically defined by the broadcaster or manufacturer of the BDR.

If during the scan for information, new channel information is identified, a message or symbol can be displayed on the display screen and/or operated audibly by the BDR to inform the user of this information. A message can also be displayed inviting the user to view the new channel or bookmark the new channel for future viewing.

New channel information is identified over old channel information using in-stream data tables in the incoming data streams, and said data derived from these tables, compared with data held in the BDR memory from previous searches.

If during background scanning of the frequency bandwidths, the tuner is required for its primary or secondary function, the inventive function of background scanning is suspended and the tuner is available for the primary or secondary function. As soon as the tuner returns to an idle status, the interrupted scanning can be resumed. This ensures that the tuner will eventually scan the entire bandwidth for channel information.

The background scanning can be periodic and/or continuous. It is also noted that conventional manual background scanning facilities can be still be user initiated as and when required.

The present invention is in contrast to some conventional BDRs where a user is required to manually program the BDR to scan for new channels or update previous channel information.

Thus it can be seen that the present invention provides a means for identifying and updating channel information using already available equipment, thereby increasing the efficiency of the broadcast data receiver.

